What is claimed:

1. A process for providing an abrasion resistant coating on the substrate wherein the abrasion resistant coating has a controlled tintability and a refractive index substantially corresponding to the refractive index of the substrate, the process comprising:

applying to at least one surface of a substrate an effective amount of a coating composition to provide a substantially uniform coating of the coating composition on the substrate, the coating composition comprising an aqueous-organic solvent mixture containing hydrolysis products and partial condensates of an epoxy functional silane, a metal oxide composite colloid, a disilane and a carboxylic acid functional compound wherein the disilane is represented by the formula $(R^{10}O)_xR^{11}_{3-x}Si-R^{12}_y-SiR^{13}_{3-x}(OR^{14})_x$; where x is 0, 1, 2 or 3 and y is 0 or 1, R^{11} and R^{13} are H or an alkyl group containing from about 1 to 10 carbon atoms, a functionalized alkyl group, an alkylene group, an aryl group, an alkylpolyether group and combinations thereof, R^{10} and R^{14} are H, an alkyl group containing from about 1 to 10 carbon atoms, an acetyl group, and combinations thereof, wherein if y is 1 then R^{12} can be an alkylene group containing from about 1 to 12 carbon atoms, an alkylenepolyether containing from about 1 to 12

carbon atoms, an aryl group, an alkylene substituted aryl group, an alkylene group which may contain one or more olefins, or an oxygen or sulfur atom, and wherein if x = 0 then R^{11} and R^{13} is a chlorine or bromine atom, and wherein the carboxylic acid functional compound is selected from the group consisting of monofunctional carboxylic acids, multifunctional carboxylic acids, anhydrides, and combinations thereof, and wherein the epoxy functional silane is present in a molar ratio to the disilane component and the metal oxide composite colloid component of from about 0.1:1 to 4:1; and

curing the coating composition to provide the substrate with a cured coating having controlled tintability and a refractive index substantially corresponding the refractive index of the substrate.

2. The process of claim 1, wherein the hydrolysis products and partial condensates of the epoxy functional silane are present in the aqueous-organic solvent mixture in an amount from about 10 to about 90 weight percent, based on the total solids of the composition.

3. The process of claim 1, wherein the carboxylic acid functional compound is present in the aqueous-organic solvent mixture in an

amount of from about .01 to 90 weight percent, based on the total weight of the composition.

4. The process of claim 1, wherein the disilane component is present in the aqueous-organic solvent mixture in an amount of from about .01 to 85 weight percent, based on the total solids of the composition.

5. The process of claim 1, wherein the metal oxide composite colloid component is present in the aqueous-organic solvent mixture in an amount of from about .01 to 80 weight percent based on the total solids of the composition.

6. The process of claim 1, wherein the solvent constituent of the aqueous-organic solvent mixture is selected from the group consisting of an alcohol, an ether, a glycol ether, an ester, a ketone, a glycolether acetate and combinations thereof.

7. The process of claim 1, wherein the solvent constituent of the aqueous-organic solvent mixture is an alcohol having the general formula ROH where R is an alkyl group containing from about 1 to about 10 carbon atoms.

8. The process of claim 1, wherein the solvent constituent of the aqueous-organic solvent mixture is selected from the group consisting of a glycol, an ether, a glycol ether and mixtures thereof having the formula $R^1\text{-}(OR^2)_x\text{-}OR^1$ where x is an integer of 0, 1, 2, 3, or 4, R^1 is H or an alkyl group containing from about 1 to about 10 carbon atoms and R^2 is an alkylene group containing from about 1 to about 10 carbons atoms and combinations thereof.

9. The process of claim 1, wherein the epoxy functional silane is represented by the formula $R^4{}_xSi(OR^5)_{4-x}$ where x is an integer of 1, 2 or 3, R^4 is H, an alkyl group, a functionalized alkyl group, an alkylene group, an aryl group, an alkyl ether, and combinations thereof containing from 1 to about 10 carbon atoms and having at least 1 epoxy functional group, and R^5 is H, an alkyl group containing from 1 to about *5* carbon atoms, an acetyl group, a $\text{-}Si(OR^6)_{3-y}R^7{}_y$ group where y is an integer of 0, 1, 2, or 3, where R^6 is H, an alkyl group containing from 1 to about 5 carbon atoms an acetyl group, another $\text{-}Si(OR^6)_{3-y}R^7{}_y$ group and combinations thereof, and R^6 is H, an alkyl group, a functionalized alkyl group, an alkylene group, an aryl group, an alkyl ether and combinations thereof containing from 1 to about 10 carbon atoms.

10. The process of claim 1, wherein the carboxylic acid functional compound is represented by the formula $R^8(COOR^9)_x$ where x is an integer of 1, 2, 3, or 4, and where R^8 is H, an alkyl group, a functionalized alkyl group, an alkylene group, an aryl group, a functionalized aryl group, an alkyl ether, and combinations thereof containing from 1 to about 10 carbon atoms, and where R^9 is H, a formyl group, a carbonyl group, or an acyl group, where the acyl group can be functionalized with an alkyl group, a functionalized alkyl group, an alkylene group, an aryl group, a functionalized aryl group, an alkyl ether, and combinations thereof containing from 1 to about 10 carbon atoms, and where R^8 and R^9 may or may not be joined by a chemical bond.

11. The process of claim 1, wherein the aqueous-organic solvent mixture further comprises alumina, silica, titania, zirconia, tin oxide, antimony oxide, iron oxide, lead oxide, bismuth oxide, and combinations thereof and wherein at least one of the metal oxide components present in the composite mixture is neither alumina nor silica.

12. The process of claim 1, wherein the amount of water present in the aqueous-organic solvent mixture is an amount sufficient to provide a

substantially homogeneous mixture of hydrolysis products and partial condensates of all reactive components.

13. The process of claim 12, wherein the aqueous-organic solvent mixture further comprises an effective amount of co-hydrolysis catalyst thereby enhancing the hydrolysis rates of the hydrolyzable components.

14. The process of claim 1, wherein the aqueous-organic solvent mixture further comprises an effective amount of a catalyst thereby providing enhanced abrasion resistance to a coating produced by curing the composition.

15. The process of claim 14, wherein the effective amount of the catalyst is from about 0.01 to about 2 weight percent, based on the total solids of the composition.

16. The process of claim 1 wherein the aqueous-organic solvent mixture further comprises an effective amount of a leveling agent thereby allowing the aqueous-organic solvent mixture to be spread on the substrate thereby providing substantially uniform contact of the aqueous-organic solvent mixture with the substrate.

17. The process of claim 1, wherein the aqueous-organic solvent mixture further comprises from about 0.1 to about 70 weight percent, based on the total solids of the composition, of a mixture of hydrolysis products and partial condensates of a silane additive represented by the formula $R^{15}_xSi(OR^{16})_{4-x}$ where x is an integer of 0, 1, 2 or 3, R^{15} is H, an alkyl group containing from 1 to about 10 carbon atoms, a functionalized alkyl group, an alkylene group, an aryl group an alkyl ether group and combinations thereof, R^{16} is H, an alkyl group containing from 1 to about 10 carbon atoms, an acetyl group and combinations thereof.

18. The process of claim 17, wherein the amount of water present in the aqueous-organic solvent mixture is an amount sufficient to provide a substantially homogeneous mixture of hydrolysis products and partial condensates of all reactive components.

19. The process of claim 18, wherein the aqueous-organic mixture further comprises an effective amount of co-hydrolysis catalyst thereby enhancing the hydrolysis rates of the hydrolyzable components.

20. The process of claim 19, wherein the aqueous-organic mixture further comprises an effective amount of a catalyst thereby providing enhanced abrasion resistance to a cured coating.

21. The process of claim 20, wherein the effective amount of the catalyst is from about 0.01 to about 2 weight percent, based on the total solids of the composition.

22. The process of claim 19, wherein the aqueous-organic solvent mixture further comprises an effective amount of a leveling agent thereby allowing the aqueous-organic solvent mixture to be spread on the substrate thereby providing substantially uniform contact of the aqueous-organic solvent mixture with the substrate.

23. A process for providing a substrate with an abrasion resistant coating wherein the abrasive resistive coating has a refractive index, the process comprising:

applying an effective amount of an aqueous-organic solvent mixture to at least one surface of a substrate to provide a substantially uniform coating on the substrate, the aqueous-organic solvent mixture comprising:

hydrolysis products and partial condensates of an epoxy functional silane, a metal oxide composite colloid, a disilane and a carboxylic acid functional compound wherein the carboxylic acid functional compound is selected from the group consisting of monofunctional carboxylic acids, multifunctional carboxylic acids, anhydrides, and combinations thereof, and wherein the epoxy functional silane is present in a molar ratio to the disilane component and the metal oxide composite colloid component of from about 0.1:1 to 4:1;

from about 0.1 to about 70 weight percent, based on the total solids of the composition, of silica, wherein the amount of water present in the aqueous-organic solvent mixture is an amount sufficient to provide a substantially homogeneous mixture of hydrolysis products and partial condensates of all reactive components; and

an effective amount of a leveling agent for permitting the aqueous-organic solvent mixture spread on the substrate thereby providing substantially uniform contact of the aqueous-organic solvent mixture with the substrate; and

curing the coating to provide the substrate with an abrasion resistant coating which has controlled tintability and a refractive index substantially corresponding to the refractive index of the substrate.

24. A process for providing a substrate with an abrasion resistant coating wherein the abrasive resistant coating has a refractive index, the process comprising:

providing an aqueous-organic solvent mixture comprising hydrolysis products and partial condensates of an epoxy functional silane, a metal oxide composite colloid, a disilane, a carboxylic acid functional compound wherein the carboxylic acid functional compound is selected from the group consisting of monofunctional carboxylic acids, multifunctional carboxylic acids, anhydrides, and combinations thereof, from about 0.1 to about 70 weight percent, based on the total solids of the composition, of a mixture of hydrolysis products and partial condensates of a silane additive represented by the formula $R^{15}_xSi(OR^{16})_{4-x}$ where x is an integer of 0, 1, 2 or 3, R^{15} is H, an alkyl group containing from 1 to about 10 carbon atoms, a functionalized alkyl group, an alkylene group, an aryl group, an alkyl ether group and

combinations thereof, R^{16} is H, an alkyl group containing from 1 to about 10 carbon atoms, an acetyl group and combinations thereof and from about 0.1 to about 70 weight percent, based on the total solids of the composition, of an acidic colloidal silica component wherein the epoxy functional silane is present in a molar ratio to the disilane component and the metal oxide composite colloid component of from about 0.1:1 to 4:1 and the amount of water present in the aqueous-organic solvent mixture is an amount sufficient to provide a substantially homogenous mixture of hydrolysis products and partial condensates of all reactive components:

applying an effective amount of the aqueous-organic solvent mixture to at least one side of the substrate to provide a substantially uniform coating of the aqueous-organic mixture on the at least one side of the substrate; and

curing the coating of the aqueous-organic solvent mixture to provide an abrasion resistant coating having a reflective index on at least one side of the substrate.

25. The process of claim 24, further comprising an effective amount of co-hydrolysis catalyst to enhance the hydrolysis rates of the hydrolyzable components.

26. The process of claim 25, further comprising an effective amount of a catalyst thereby providing enhanced abrasion resistance to a cured coating.

27. The process of claim 26, wherein the effective amount of the catalyst is from about 0.01 to about 2 weight percent, based on the total solids of the aqueous-organic solvent mixture.

28. The process of claim 27, wherein the aqueous-organic solvent mixture further comprises an effective amount of a leveling agent thereby allowing the aqueous-organic solvent mixture to be spread on the substrate thereby providing substantially uniform contact of the aqueous-organic solvent mixture with the substrate.

29. A process for providing a substrate with an abrasion resistant coating which has a refractive index, the process comprising:

applying an effective amount of an aqueous-organic solvent mixture to at least one surface of a substrate to form a coating of the aqueous-organic solvent mixture on the at least one surface of the substrate the aqueous-organic solvent mixture contains hydrolysis products and partial condensates of an epoxy functional silane, a metal oxide composite colloid, a disilane and a carboxylic acid functional compound wherein the carboxylic acid functional compound is selected from the group consisting of monofunctional carboxylic acids, multifunctional carboxylic acids, anhydrides, and combinations thereof, and further wherein the epoxy functional silane is present in a molar ratio to the disilane component and the metal oxide composite colloid component of from about 0.1:1 to 4:1; and from about 0.1 to about 70 weight percent, based on the total solids of the aqueous-organic solvent mixture of a colloidal silica component, and wherein the colloidal silica component is acidic, basic or neutral; and

curing the coating of the aqueous-organic solvent mixture on the at least one surface of the substrate to provide the substrate with an abrasion resistant coating.

30. The process of claim 29, wherein the colloidal silica component is an acidic colloidal component.

31. The process of claim 30, wherein the amount of water present in the aqueous-organic solvent mixture is an amount sufficient to provide a substantially homogeneous mixture of hydrolysis products and partial condensates of all reactive components.

32. The process of claim 31, wherein the aqueous-organic solvent mixture further comprises an effective amount of co-hydrolysis catalyst thereby enhancing the hydrolysis rates of the hydrolyzable components.

33. The process of claim 32, wherein the aqueous-organic solvent mixture further comprises an effective amount of a catalyst thereby providing enhanced abrasion resistance to a cured coating.

34. The process of claim 33, wherein the effective amount of the catalyst is from about 0.01 to about 2 weight percent, based on the total solids of the aqueous-organic solvent mixture.

35. A process for providing an abrasion resistant coating on the substrate which has a refractive index, the process comprising:

applying to at least one surface of substrate an effective amount of an aqueous-organic solvent mixture containing hydrolysis products and partial condensates of an epoxy functional silane, a metal oxide composite colloid, a disilane, a carboxylic acid functional compound and from about 0.1 to about 70 weight percent, based on the total solids of the aqueous-organic solvent mixture, of a mixture of hydrolysis products and partial condensates of a silane additive represented by the formula $R^{15}{}_xSi(OR^{16})_{4-x}$ where x is an integer of 0, 1, 2 or 3, R^{15} is H, an alkyl group containing from 1 to about 10 carbon atoms, a functionalized alkyl group, an alkylene group, an aryl group an alkyl ether group and combinations thereof, R^{16} is H, an alkyl group containing from 1 to about 10 carbon atoms, an acetyl group and combinations thereof and wherein the carboxylic acid functional compound is selected from the group consisting of monofunctional carboxylic acids, multifunctional carboxylic acids, anhydrides, and combinations thereof, and wherein the epoxy functional silane is present in a molar ratio to the disilane component and the metal oxide composite colloid component of from about 0.1:1 to 4:1;

and from about 0.1 to about 70 weight percent, based on the total solids of the composition, of a colloidal silica component, wherein the colloidal silica component is acidic, basic or neutral; and

curing the aqueous-organic solvent mixture to produce a substrate having an abrasion resistant coating having a refractive index substantially corresponding to the refractive index of the substrate.